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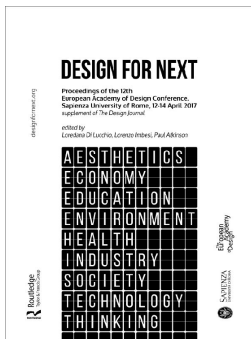
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Containers of Stories: using co-design and digital augmentation to empower the museum community and create novel experiences of heritage at a house museum

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Abstract: This paper presents current research on the design and evaluation of tangible interaction within house museums – a particular type of heritage site. *Containers of Stories* was an interactive installation co-designed with the volunteers at the Bishops' House museum, one of the few surviving Tudor buildings in Sheffield, UK. Dating from the 16th century, the house was turned into a museum in the 1970s for its historical and social importance and is now managed by a community of local volunteers who constantly needs to increase both visitors' interest and awareness of the place for its survival. The experience of co-designing *Containers of Stories* pushed the volunteers beyond day-to-day management toward more creative and curatorial roles. This paper gives insights on how this hybrid physical-digital installation succeeded in engaging visitors in new ways with heritage that has the potential to strengthen the resilience of the community.

Keywords: Design research, Co-design, Tangible interaction, Heritage, Community engagement

1. Introduction

This paper presents a case of design research exploring co-design opportunities where tangible interaction and embedded technologies are used together to co-create novel experiences of heritage at house museums. Tangible interaction (Hornecker & Buur, 2006) informs this research with particular focus on material aspects of experience and on technology used to digitally enhance objects, whether by being embedded within them or surrounding them in space. By using a co-design process, this research re-visits what communities mean in practice – creating *with* instead of *for* them, and considering experiences as socially constructed in constant motion, unstable and uncertain rather than as fixed entities (Waterton & Smith, 2010).

In museums, participatory methods have already been adopted to involve visitors (Smith & Iversen, 2014) and curators (Halloran, Hornecker, Fitzpatrick, Millard & Weal, 2005; Petrelli, Dulake, Marshall, Kockelkorn & Pisetti, 2016), in the design of digitally enhanced exhibits. This research focuses on a community of volunteers, actors of growing importance across the whole cultural sector, as without them many museums and heritage sites would have difficulties to function or could even cease to operate (Holmes, 2003; Orr, 2006). Indeed, the cultural sector tends to rely more and more on volunteers who take on a range of roles including front of house, administration, preservation and exhibition development. This is particularly critical for a small local heritage site that does not receive much funding, but plays a significant role for the local community. However, despite the vital role they play in museums, volunteers are clearly underrepresented and need more recognition among the museum community and scholarship (Holmes, 2003; Millar, 1991; Orr, 2006).

This research addresses empowerment issues, and aims to increase the voice of volunteers through co-design and digital augmentation at the Bishops' House museum (BHM): one house museum entirely ran by a group of local volunteers, located in one of the public parks in the city of Sheffield in the UK. Described by the volunteers as a time-capsule, the BHM fits the category of "social history house" (Young, 2012) where everyday activities happened in various historical periods. In the 1970s, the house was turned into a museum and restored back to its 17th century structure to showcase the social history collection of Museums Sheffield. When Museums Sheffield relocated their collection elsewhere in 2010, the BHM was saved from closure by the local community who then established themselves as "The Friends of Bishops' House". Since 2015, the first author has been volunteering at BHM to immerse herself in the museum culture and became in turn an active member of this community.



Figure 1 "Containers of Stories" (2016). Interactive installation co-designed with the museum volunteers, exhibited at the Bishops' House during the exhibition *Curious House* (April – May 2016). Photograph ©Gemma Thorpe.

To describe volunteers, Holmes & Edwards (2008) draw on the possible progression from “non-visitors”, “occasional and frequent visitors” to “volunteers”. They argue that engaging frequent visitors in a more intimate experience of a museum could push them one step closer to volunteering. The interactive and co-designed installation *Containers of Stories* (Figure 1) encouraged a more intimate exploration of the place for volunteers and proved to engage visitors on personal and emotional levels with the stories and artefacts on display whilst fostering repeated visits to the BHM.

We discuss participatory and “designerly” (Cross, 1982) approaches that are used to understand the heritage site from the volunteers’ perspective and co-envision with them a novel experience of heritage. By exploring the visitor-volunteer continuum, this paper shows how both the design process and its outcome have supported and empowered the role of volunteers at BHM. The following sections contextualise the research, introduce the methodology and detail two participatory methods: cultural probes and co-design workshops. We then reflect on how *Containers of Stories* has allowed sharing one’s own experience, creating new insights and opportunities for social interaction.

2. Research background

Research-through-design was used to develop *Containers of Stories*, a “hybrid design” where visitors could manipulate “physical and digital material in a visible and interesting manner” (Bannon, Benford, Bowers & Heath, 2005, p.62). In response to literature in critical heritage studies (Dudley, 2013), the design outcome emphasized the visitors’ physical experience with cultural heritage by integrating technology into material objects instead of creating a parallel and detached digital experience (Petrelli, Ciolfi, van Dijk, Hornecker, Not & Schmidt, 2013). Previous studies in the field of Human-Computer Interaction have shown that the use of screen-based interfaces in museums often leads to an isolating experience, which hinders social interaction and becomes a substitute for artefacts on display (Lanir, Kuflik, Dim, Wecker & Stock, 2013; Vom Lehm & Heath, 2005). In contrast, this research used embedded technologies and digital augmentation of place to engage visitors in forms of “tangible interaction” (Hornecker & Buur, 2006), where interaction is mediated by embedded technology and digital augmentation of physical spaces with an emphasis on the material aspects of experience – a key feature of visitor experience in house museums (Naumova, 2015).

House museums present an interesting and relatively underexplored context for the integration of technology. Unlike traditional museums, artefacts are displayed in a domestic setting, often in their original context, and out of their protective cases and with limited written interpretation attached to them. In house museums not only the content or collection but also the whole house is considered as a “historic object” (Naumova, 2015, p.3), meaning that content and container are one (Naumova, 2015; Pavoni, 2001; Young, 2007). This encourages a more embodied and multisensory experience where visitors are able “to ‘insert’ themselves within the cultural production of heritage” (Naumova, 2015, p.1). The “rhetoric of home” (Young, 2012, p.1), intrinsic in house museums, can be powerful as visitors usually find personal resonances within such a domestic setting, which presents the museum’s stories in a familiar tone (Naumova, 2015; Pavoni, 2001; Young, 2007).

In this research, participatory and designerly approaches are used to challenge authoritative and traditional models of heritage leading to envision a different kind of museum, one that could display the depths of our humanity by telling ordinary, individual and personal stories rather than universal ones (Pamuk, 2012). Pamuk’s manifesto (2012) echoes Smith’s criticism (2006) about authoritative discourses of heritage where heritage is conserved as “an unchanging monument to the past” (p.6). For Smith, heritage is not only defined as the artefacts or site but also as the activities around it – e.g. acts of communicating, remembering and meaning-making. In designing for house museums, this

research considers and values intangible forms of heritage such as memories where things are created, even invented, reconstructed and recombined over time (Falk, 2009, p.135). Here we promote views of heritage as an actively used, remade and negotiated process rather than an unchanging vista, and where relationships between expert, heritage and visitor or amateur can be re-arranged from being top-down to being bottom-up relationships (Smith, 2006).

2. Methodological approach

Research-through-design is used as a particular way of thinking and for its potential to generate new knowledge and directions for the future (Frayling, 2015; Gaver, 2012) instead of limiting the research to the past and present (Zimmerman & Forlizzi, 2008). The design process unfolds through an iterative framework where co-design or “collective creativity” (Sanders & Stappers, 2014) occurs throughout the whole design process: from the pre-design or “fuzzy front end”, to post-design phases (Sanders & Stappers, 2008).

Participatory and creative methods such as cultural probes and co-design workshops are ways of conducting research *with* people rather than *about* them and “to bring the people we serve through design directly into the design process in order to ensure that we can meet their needs and dreams for the future” (Sanders & Stappers, 2012 p.14). Participation occurs at different levels as the role of participants shifts from being active to more reflective (Vines, Clarke, Wright, McCarthy & Olivier, 2013). The value of using creative methods as it “privileges such things as play, intuition, serendipity, imagination and the unexpected as resources for making sense” (Kara, 2015, p.22) is key to research that is explorative in nature, such as the project we describe here. Starting with a contextual understanding of the place, the process moves to prototyping and testing “while interacting with those who will use the solutions, in order to continuously learn from them through the development and implementation phases. As a consequence, relevant and innovative solutions can emerge” (Fuks, Moura, Cardador, Vega, Ugulino & Barbato, 2012, p.682).

3. Understanding heritage through the volunteers’ eyes

3.1 The creative package: exploring and getting inspired

Originally, cultural probes were designed to provide inspiration rather than information (Gaver, Dunne & Pacenti, 1999), as a means to elicit inspirational responses from people (Gaver, Boucher, Pennington & Walker, 2004). While adaptations of this method have generated concerns among the design community (Boehmer, Vertesi, Sengers & Dourish, 2007), they have also proved to be in some cases valuable tools for gaining understanding of people’s lived experience (e.g. Wallace et al., 2013a). For this research, cultural probes were adapted into “creative packages” (Figure 2): a collection of six open-ended tasks for participants to take away and complete individually. Inspired by field notes taken while volunteering at the museum, the package was introduced as an opportunity to involve a group of museum volunteers in the design process. Each task aimed to give volunteers the opportunity to reflect on their past and current role at the Bishops’ House museum as well as enabling them to imagine new visitors’ experiences that were not bound by current limitations at the museum.



Figure 2 Creative packages completed by ten research participants (2016).

In the creative package, the bespoke artefacts were designed with particular attention to their materiality and form, which were informed by a set of evocative themes and open-ended questions (Figure 3). The creative package was completed by ten participants and enabled learning about the BHm from the volunteers' point of view, asking questions "through gentle, provocative, creative means offering a participant intriguing ways to consider a question and form a response through the act of completing the probe creatively" (Wallace, McCarthy, Wright & Olivier, 2013a, p.3441). Once the package was completed, each participant met with the researcher at the museum to discuss the materials created in response to the tasks, and reflected on what these meant for them.

The first task featured in the pack was "Best wishes", where participants sent a postcard to share their experience of being a volunteer at the museum. "A house is not a home" was a model house kit that participants customised to explore the relationship between a museum and a home and to reflect on what feeling at home meant to them. With the third task, participants used a map and personalised sketchbook to highlight their favourite stories in the museum and plan their dream exhibition. In "House of cards", participants customised a series of interlocking cards to identify the skills of volunteers and assets of the museum. With "Seed wish", a pack of seeds was given to participants and used as a metaphor to encourage them to think about the future for the museum e.g. what would they like to see growing? The last task "Drawers are a place of secrets" was more abstract and prompted volunteers to imagine what previous inhabitants or themselves would have kept in "the secret drawer" – an existing feature of a chest exhibited at the museum.

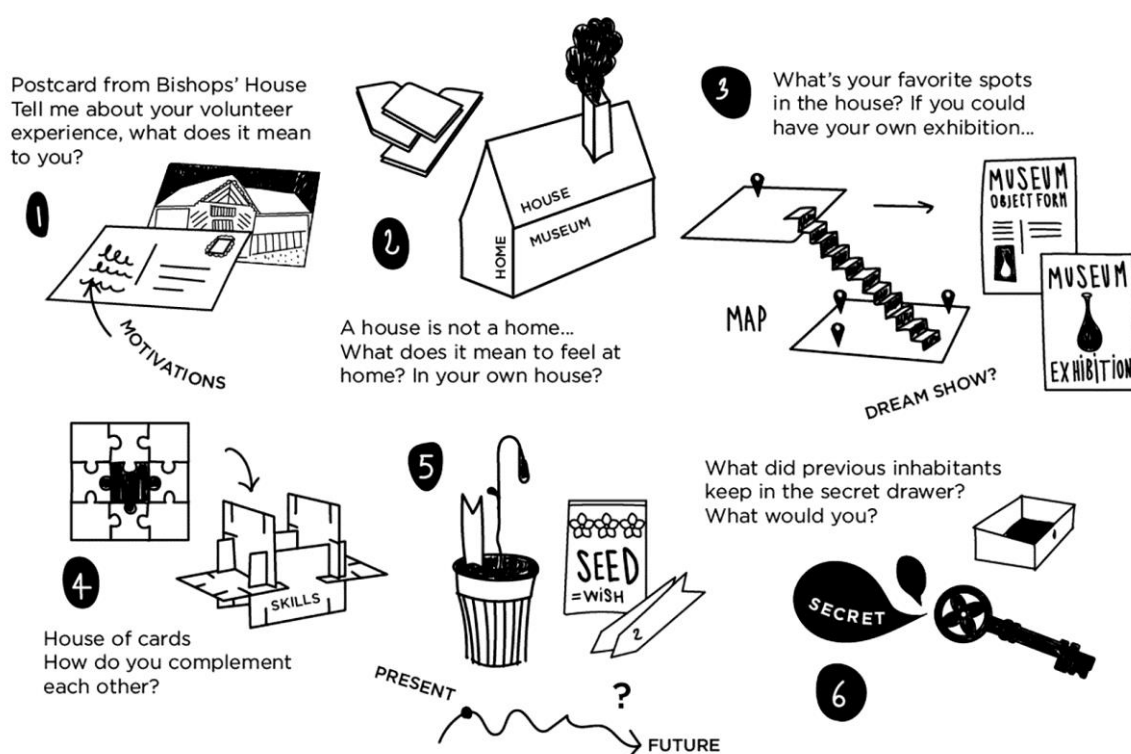


Figure 3 Sketches of six evocative tasks featured in the creative package (2016).

While providing personal insights and inspiration, the creative package started a dialogue with the volunteers and highlighted the personal (1), social (2) and emotional (3) dimensions of volunteering at the museum.

1. Participants volunteer at the museum because they can be close or involved in something they are passionate about (e.g. history). Most of them have become personally attached to the site, and the materials created in response to each task represented the broad interests they all have in the museum and emphasised the different expertise and personality they bring to the BHm.
2. They described social interaction on a human level. They emphasised the active role volunteers have in sharing their knowledge and communicating heritage to visitors. In the context of BHm, heritage was not restricted to the physical building or to something located in the past but described by Wes, one of the volunteers, as *"living heritage"*: something more active, shared and created by both past and present communities. In our discussion, feeling part of a community and making new friends were also emphasised: *"[...] we met because of wanting to keep an old building open but one of the best things is that many of us became real friends"* (Ken, volunteer).
3. Finally, the emotional dimension of volunteering was discussed when recalling or facing the threat of losing the house. Volunteers feel extremely responsible and protective about BHm not only because it is an old building but also for what it represents for them and future generations e.g. *"this is part of our community, local people actually care about it"* (Eileen, volunteer).

3.2 The benefits and values of creative methods

This section shows how the creative package succeeded in increasing the volunteers' intrinsic interest in the place by creating a sense of flow (Csikszentmihalyi & Hermanson, 1999) through the

completion of creative tasks that led to personal growth. For example, its material structure, personal appropriation and engagement of sensory faculties played an important role and are summarised below to show how this creative exercise benefited both the researcher and participants.

Designing the creative package was a highly reflexive exercise for the researcher where important choices were made. The metaphors and materials used for the different activities, their different levels of abstraction and how the whole package unfolded were important decisions that informed participants' responses. When reflecting upon their experience of completing the creative package, participants emphasised the qualities of how it was produced and structured (e.g. there was a progression and connection between activities), and observed how it helped them in channelling their thoughts while keeping their attention focused: *"I thought the whole thing was a privilege. It was so creatively produced that each activity triggered something new"* (Jan, volunteer). In general, participants felt privileged to be part of this process and emphasised their appreciation for the level of care that was put into the conceptual and design aspects of each activity, which in turn shown them evidence of the researcher's motivations and investment in the project: *"I thought you [the researcher] got into a lot of troubles [sic], it would have been so easy to give us a questionnaire. I was just fascinated by all!"* (Liz, volunteer).

With this method, both the researcher and volunteers were able to contribute and express something of themselves in the study. In this case "probes become a common ground as the process becomes a way of building a relationship in a more democratic manner than the roles of researcher and participants often afford" (Wallace et al., 2013a, p.3449). The package facilitated a two-way dialogue where personal insights from the researcher's own experience as a volunteer at the museum were translated into a set of small artefacts for initial triggers, whilst leaving enough space for participants to appropriate each activity: *"It makes you think of what you would want [the museum] it to look like. You can express a bit of your personality in the kit"* (Wes, volunteer). When volunteers talked the researcher through their creative response, the conversation held a sense of shared creation where the parties built on each other's comments by using the personalised artefacts to explore ideas. By completing the package, the volunteers' role shifted from passive to being more active and creative: *"It made me think about this place in a very different way than I have ever thought about it. It means now that I have got a much bigger picture in my head than I would have ever done by just sitting in here or even learning on how to do a tour"* (Jan, volunteer). In this process, they also gained in confidence and critically reflected upon their role:

"How do we preserve not just the building but the cultural history? Can we bridge between the building as a shell and what it meant to the community? How do we link living heritage to a building?" (Wes, volunteer).

Finally, in completing the creative package participants were engaged on a sensory level, which encouraged them to think about their experience in unusual ways: *"It has taken my senses, I thought about the sounds and the smells... What I hear, what it feels like to touch things and apart from taste, I think I thought it all!"* (Jan, volunteer).

4. Co-designing novel experience of heritage with the volunteers

4.1 "Containers of Stories": co-designing tangible interaction

Four volunteers participated in two co-design sessions (Figure 4) to develop their ideas generated through the creative package into an interactive installation for the public. The sessions were divided

into different stages where the four participants were prompted to think of a set of four objects to represent the story they generated. In this creative process, more practical aspects such as the embedded technologies to be used for the final installation were discussed (e.g. NFC tags and readers; LED and speakers); participants were shown sketches to discuss the overarching concept for the interactive installation.



Figure 4 Co-design session with four participants. Details of three work-in-progress drawers featuring participants' ideas for stories and objects.

Each participant developed their story and modelled or sketched potential objects to match each of them, and created a mini exhibition in a drawer. They themselves recorded the different stories they had generated, the objects featured in the drawers were handmade or lent by the volunteers and, in some cases, objects were purchased from antique shops. As a result, the four cabinets (each representing a volunteer's story) featured a diverse and personal collection of objects that connected back to the stories and original objects displayed in the museum (Figure 5). When exhibited, the cabinets featured the first name of the volunteer on the front of each drawer to increase the personal touch and contributions the four participants brought to the installation.

The four cabinets told unique stories from each volunteer's perspective in different ways: e.g. using facts or speculation, evocative sound, nursery rhymes etc. Indeed, both objects and stories on display in the cabinets reflected each volunteer's own interests and personality. For example, Wes' initial motivation for being a volunteer at the BHM was his passion for craftsmanship and Tudor architecture. As a craftsman himself, Wes chose to tell the story of one of the first inhabitants to explore what it meant to build and own a home like Bishops' House in the 16th century. In contrast, Jan's cabinet featured objects that were used at the BHM as ambient objects e.g. rabbit skin, lavender bag. During the co-design sessions, she explained her concept by linking each object to a nursery rhyme (e.g. rabbit skin with "bye bye baby bunting") to evoke visitors' childhood memories followed by a set of questions to prompt their critical thinking about how different life used to be e.g. "Can you imagine? No babygrows, no nappies – just a rabbit skin..." etc. Through the co-design sessions, the four participants gained confidence and took ownership of the project.

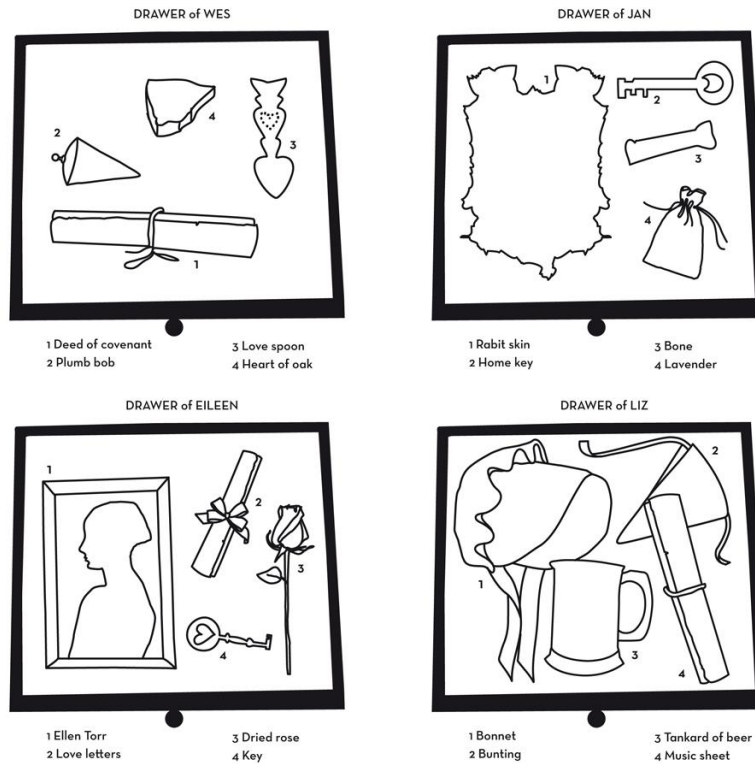


Figure 5 “Containers of Stories” (2016). Illustration by Caroline Claisse showing the collection of objects featured in each drawer.

4.2 Supporting the volunteers’ role through co-design and digital augmentation

Containers of Stories featured four interactive cabinets (Figure 1) placed within the museum where visitors were able to handle the objects curated by the volunteers and listen to their stories by placing objects on the top of each cabinet (Figure 6). The co-designed installation was one of the four interventions displayed as part of “Curious House” – an exhibition where four artists (including the first author) used their creative practice to unlock the stories behind the house. The exhibition was a success: feedback from the community was very positive and the exhibition generated a significant increase in visitors’ footfall to the BHm (e.g. 200 visitors on the first weekend with respect to ~50 on normal weekends).

Observations and questionnaires were conducted with visitors over two weeks, and three themes were identified through the data using thematic analysis (Braun & Clarke, 2006) illuminating how *Containers of Stories* created novel ways of experiencing heritage at BHm. First, visitors engaged at personal and emotional levels with the objects and stories created by the volunteers. By connecting the objects to both the place and themselves, visitors felt part of the house and imagined how it used to be in comparison with today. Thus, they identified with the “people” behind each cabinet (whether with the volunteers or the characters in their stories) and talked about the cabinets as if they were real people. Secondly, visitors engaged with heritage through tactile encounters: they acknowledged the power of touch and the fact that touching objects made them more curious about the stories. On the other hand, they described the evocative stories as key component of their experience, thus the content created by the volunteers was considered as important as the objects on display within the cabinets. Finally, visitors described their experience as “magic” or innovative and as a new way to learn about the house. In brief, the personal and evocative content, the multisensory

aspect and the way technology was concealed all contributed to create a novel visitor experience of heritage at BHm.



Figure 6 “Containers of Stories” (2016). Detail of Wes’ cabinet and a visitor holding a love spoon (handmade by Wes) to trigger one part of the story.

In a subsequent focus group session, the volunteers reflected upon the success of *Containers of Stories* as an opportunity to bring them together and create something meaningful for them personally while being a “joint effort” (Eileen, volunteer). They shared their own observations and reported that visitors – particularly children – became more curious about the house, and that the cabinets increased the time visitors spent in the room while encouraging repeated visits to listen to the different stories. One volunteer recounted:

“One child came and said: ‘Who is Eileen and Liz and Jan and Wes?’ I said: ‘They are all volunteers and I am Jan’. She said: ‘That Jan!?’ [Pointing to the cabinet]. And I said: ‘That Jan!’ She said: ‘Could you sing me one of the songs?’ So I sang one of the nursery rhymes and she said: ‘It is, it is!’ And she shouted to her friends: ‘The person on the tape is here!’ ” (Jan, volunteer).

When discussing the visitors’ feedback, we clearly identified the benefits of using a co-design process and digital augmentation to support the volunteers’ role while enhancing the visitor experience. It was clear that, by creating and curating their own content, the volunteers went beyond maintaining heritage towards a more active role that fulfilled their personal interests in the place. Indeed, the content created by volunteers was considered by visitors as valid as the museum’s interpretation e.g. the stories were described by visitors as “short bits of information”. The cabinets became an avatar that enabled volunteers to use their own voice and personal interpretation of BHm: this challenged the way heritage is usually produced and interpreted in museums to in turn increase the volunteers’ presence in the place and make them feel part of its history: “*I thought... What a privilege it was to be a volunteer in a place and then become part of its history*” (Jan, volunteer).

5. Conclusions

This paper gave insights on *Containers of Stories* and showed how the digital augmentation of place and the co-creation of a novel experience of heritage have empowered museum volunteers – a group currently underrepresented in the museum community. At the Bishops' House, technology was combined with participatory and creative methods to increase the voice of volunteers, which in turn enlivened the heritage site and enabled new ways for sharing knowledge and experiences of the place. It supported the volunteers to become “expert of their experience” (Sanders & Stappers, 2008) by providing them with the tools for idea generation, curation and self-expression.

The creative and participatory methods adopted have allowed for an exploration of living heritage as the heritage of the house was actively used, appropriated, remade and curated by volunteers for *Containers of Stories*. Beside the impact on the volunteers and their role, the installation provided visitors with a more intimate and emotional experience of the place through the eyes of the volunteers, which was highly appreciated by visitors. Most importantly, volunteers became mediators between the place and its visitors, which shows potential for increasing the interest of local communities in heritage sites. Future design interventions will investigate further the sustainability of this approach and its impact on the community over time and will continue exploring the potential of co-design and digital augmentation to increase people's awareness and interest in house museums to secure them for future generations.

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